



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/535,346

10/03/2005

Tadashi Ishikawa

52433/797

7148

26646

7590

04/17/2008

KENYON & KENYON LLP  
ONE BROADWAY  
NEW YORK, NY 10004

EXAMINER

SHEVIN, MARK L

ART UNIT

PAPER NUMBER

1793

MAIL DATE

DELIVERY MODE

04/17/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/535,346	<b>Applicant(s)</b> ISHIKAWA ET AL.	
	<b>Examiner</b> Mark L. Shevin	<b>Art Unit</b> 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 20 February 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Status of Claims***

1. Claims 1-6, filed in the response dated February 20<sup>th</sup>, 2008, are currently under examination. Claims 1-6 were amended by Applicant in this reply. In the previous Office Action, mailed November 15<sup>th</sup>, 2007, claims 1-6 were pending and all claims were rejected.

### ***Amendments to Specification***

2. The amendment to the title of the application, now "Method of Production of Steel Product with Nanocrystallized Surface Layer", is recorded.

### ***Status of Previous Rejections***

3. The previous rejection of claim 1 under 35 U.S.C. 112, second paragraph in the Office action dated November 15<sup>th</sup>, 2007 has been withdrawn in view of Applicant's deletion of the indefinite portion in the amendment to claim 1.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. The previous rejections of claims 1-6 under 35 U.S.C. 103(a) in the Office action dated November 15<sup>th</sup>, 2007 has been maintained and the introductory text reproduced below for reference:

6. Claim 1-6 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Statnikov** (US 6,338,765) in view of **Lu** (K. Lu, Nanocrystalline metals crystallized from amorphous solids: nanocrystallization, structure, and properties, *Materials Science and Engineering*, R16 (1996) p. 161-221.).

With respect to the amendments to claims 1-6, (regarding the additional limitation of a "steel product"), Statnikov ('765) teaches that his invention provides methods of treatment for work products of materials such as steel (Abstract) and as such the amendments to the claims do not define over the prior art of record as '765 teaches a ultrasonic impact treatment on steel.

***Response to Applicant's Arguments:***

5. Applicant's arguments filed February 20<sup>th</sup>, 2008 have been fully considered but they are not persuasive.

First Applicant asserts that the '765 patent (Statnikov) does not disclose or suggest the formation of a nanocrystallized surface layer (p. 6, para 5) and that Lu (Nanocrystalline materials...) only teaches forming nanocrystals throughout the entire thickness of a bulk material (p. 7, line 2-4).

The Examiner notes that '765 does teach (col. 14, lines 15-32) that during ultrasonic peening, in the surface area of plastic deformation, local heating to very high temperatures and under controlled conditions results in a modified grain structure which has an almost amorphous submicroblock structure." This "submicroblock" structure could be reasonably interpreted as a nanocrystalline structure but the point is that a great deal of energy is put into the surface of the steel material and that microstructure

Art Unit: 1793

reverts to an amorphous or near amorphous structure but as stated in the previous Office Action (p. 4, para 3), Lu is used to teach the heat treatment step to convert this amorphous white layer into nanocrystals.

Lu teaches that heat treatment can convert the amorphous phase to a completely polycrystalline material with ultrafine crystalline (p. 163, para 2, lines 1-4) and that Statnikov had formed an amorphous white layer only on the treated body surface (col. 7, line 5 and 20-31). Thus as Lu teaches, a heat treatment to the article will convert the amorphous, i.e. the surface region, to a nanocrystalline layer. Lu further states that it is very simple and convenient to control this heat treatment in preparation procedures (p. 163, para. 3, i). Furthermore, the Examiner does not acquiesce in the assertion that Lu only obtained nanocrystals throughout the bulk of a material as Lu teaches (p. 164, para 2, lines 2-4) that controlled crystallization of amorphous alloys can be used to obtain partially crystallized materials with nanometer-sized crystallite embedded in the residual amorphous matrix. Thus not all of the amorphous white layer need to converted to nanocrystals using the controlled heat treatment processes of Lu.

### ***Conclusion***

**6.** Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

Art Unit: 1793

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

**-- Claims 1-6 are finally rejected**

**-- No claims are allowed**

The rejections above rely on the references for all the teachings expressed in the texts of the references and/or one of ordinary skill in the metallurgical art would have reasonably understood or implied from the texts of the references. To emphasize certain aspects of the prior art, only specific portions of the texts have been pointed out. Each reference as a whole should be reviewed in responding to the rejection, since other sections of the same reference and/or various combinations of the cited references may be relied on in future rejections in view of amendments.

All recited limitations in the instant claims have been met by the rejections as set forth above. Applicant is reminded that when amendment and/or revision is required, applicant should therefore specifically point out the support for any amendments made to the disclosure. See 37 C.F.R. § 1.121; 37 C.F.R. Part §41.37 (c)(1)(v); MPEP §714.02; and MPEP §2411.01(B).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark L. Shevin whose telephone number is (571) 270-3588. The examiner can normally be reached on Monday - Thursday, 8:30 AM - 5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy M. King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

***/Mark L. Shevin/***

Examiner, Art Unit 1793

***/Roy King/***

Supervisory Patent Examiner, Art Unit 1793

April 10th, 2008

10-535,346